



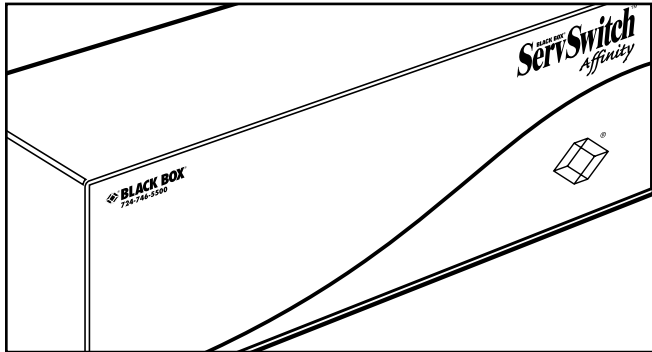
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Black Box Corporation.

# BLACK BOX<sup>®</sup>

## NETWORK SERVICES

Black Box Corporation • 1000 Park Drive • Lawrence, PA 15055-1018 • Tech Support: 724-746-5500 • [www.blackbox.com](http://www.blackbox.com) • e-mail: [info@blackbox.com](mailto:info@blackbox.com)

## SERVSWITCH AFFINITY



**Affordable many-to-many  
multiplatform KVM switching.**

### Key Features

- ▶ **As many as 16 users have keyboard/mouse/video control over as many as 1024 PC, Sun, RS/6000, SGI, HP, and/or Alpha computers.**
- ▶ **Easily expandable with plug-in port cards and flexible cabling.**
- ▶ **Free lifetime firmware upgrades.**
- ▶ **Supports video resolutions up to 1280 x 1024.**
- ▶ **High levels of security, including passwords and access profiles.**
- ▶ **Controlled through on-screen display, with additional keyboard commands and a terminal-based serial-port options menu.**
- ▶ **Some models have redundant power supplies.**

Is your server room growing by leaps and bounds? Wouldn't it be nice to have a keyboard/video/mouse-switching system that could keep up with all the hardware, all the users, the constant changes, and the realities of your budget?

Our ServSwitch Affinity™ could be the one. It supports most major hardware platforms, including IBM® PS/2®, PC/AT®, and RS/6000®; Sun®, SGI™; HP® 700 and 9000 series; and Compaq® Alpha™. IBM type computers can use any keyboard mode and any of a variety of mouse types. Video can be any of several types at up to 1280 x 1024 resolution.

You can attach as many as 16 computers to a single unit or 1024 computers to a daisychained ServSwitch Affinity system. Either way, you can also attach up to 4, 8, or 16 independent users; more users can be connected, but they'll have to contend for access.

Here's how it works: Each ServSwitch Affinity has four slots for port cards. 0 x 4 port cards (product code KV1300C) have four CPU (computer) ports and a serial port only; 1 x 4 cards (KV1301C-R2) also have a KVM (user) port.

The ServSwitch Affinity chassis also has a fifth, top slot

used for expansion purposes; the 16-user models have a matching sixth, bottom slot. 4-user models ship with a terminator card (KV1304C) installed in the expansion slot; you can swap in a 4-User Expansion Card (KV1305C) if you'll be daisychaining the ServSwitch Affinity. 8- and 16-user models, which are designed to be part of a daisychain, come without anything installed in the expansion slot(s). You need to purchase and install an 8- and 16-User Expansion Card (KV1306C or KV1308C) for each slot for the unit to work.

One difference between the 4-user ServSwitch Affinity models with single power supplies is which cards they're preinstalled with; see the start of the **Ordering Information** on page 4 for a list of which cards come with each model. The 4-User Standalone Chassis models (as well as the 1 x 4 port card) also offer serial emulation. This enables access to any RS-232 serial device.

Add capacity to your ServSwitch Affinity system at any time by installing port cards in vacant slots or add more chassis to a daisychain.

The port card's serial ports are

used for terminal-based initial system configuration; they are also used to upgrade the ServSwitch Affinity's firmware (upgrades are free for the lifetime of the ServSwitch Affinity!).

The ServSwitch Affinity's main controls are its on-screen menus (with a full range of configuration and operating functions). These menus are augmented by a number of keyboard commands.

For added security, the ServSwitch Affinity supports password-protected access groups. Computers can belong to multiple groups, but users can only belong to one. Users will only be able to access the computers in their group.

When users do access computers, they'll have one of four assigned access levels: view only (no keyboard/mouse control), share (view access until current user becomes inactive, then add keyboard and mouse), control (sole control but others can view), or private (sole control, no one else can interrupt or view).

Models with dual, redundant power supplies are available. If one power supply fails, the other powers the load until you install a replacement supply.

# Specifications

**CPUs Supported:** IBM PC and compatibles, PS/2, Sun, and most PC UNIX® (RS/6000, HP9000™, SGI, DEC™ Alpha, and others); daisychainable to connect up to 1000 CPUs

**Configuration per Chassis (Maximum):** KV132A-R2: (2) users, (8) CPUs, (1) expansion card; KV130A, KV130DA, KV134A-R2, KV138A, KV138DA: (4) users, (16) CPUs, (1) expansion card; KV139A, KV139DA: (4) users, (16) CPUs, (2) expansion cards

**Construction:** Steel chassis

**Mice Supported:** User: PS/2 or Sun; CPU: Serial or PS/2, Sun Microsystems® and compatibles

**Maximum Distance:**  
20 ft. (6.1 m) of CPU or user cable—possibly as much as 100 ft. (30.5 m) if cable is coaxial, depending on CPUs, monitor, and video resolution—from any ServSwitch Affinity port card to any device attached to it;  
100 ft. (30.5 m) of expansion cable between any two ServSwitch Affinity units;  
50 ft. (15.2 m) of serial cable from the RS-232 port of any ServSwitch Affinity port card to a computer's serial port

**Resolution:** Up to 1280 x 1024, but will depend on the length of CPU and user cables in your system

**Serial (RS-232) Characteristics:**  
Protocol: Asynchronous;  
Data format: 8 data bits, 1 stop bit, no parity (fixed);  
Data rate: 9600 or 57,600 bps

**Hardware Required:** Monitor that supports your computers' highest video standard; in multiplatform applications, should be multisync model that can accept video from either Composite sync or separate horizontal/vertical sync signals

**Compliance:** CE, FCC Part 15 Subpart B Class A, IC Class/ classe A

**Standards:**  
With original Serv cabling: VGA (color or monochrome/page white) video;  
With original Serv cabling (minimal) or coaxial cabling (recommended): SVGA video;  
With coaxial cabling: XGA (color or monochrome), Sun, RS/6000, or SGI video

**Fuses:** KV13xDA models: Autoresetting switch fuses that cut in when power surges exceed the maximum ratings of the chassis

**User Controls:**  
For system: Keyboard commands and on-screen menus;  
On ServSwitch Affinity chassis: Rear-mounted ON/OFF rocker switch(es);  
KV13xDA models: (2);  
All other models: (1);  
On all expansion cards (KV1305C–KV1306C, KV1308C): Board-mounted BUS/RING jumper;  
On 8-user expansion cards (KV1306C, KV1308C): (2) Board-mounted jumper blocks for user-port numbering

**Interfaces:**  
On CPU ports and user ports of Port Cards and IN 1 and OUT 1 ports of primary expansion cards:  
Proprietary composite of:  
IBM PS/2, PC/AT, or Sun compatible keyboard;  
PS/2, RS-232 serial (except on user ports), or Sun compatible mouse; and  
Video (see Standards above);  
IN 1 and OUT 1 also carry system-control signals;  
On expansion cards' other IN and OUT ports: Proprietary video composite (see Standards above);  
On serial ports of port cards: EIA/TIA RS-232 proprietary pinning on RJ-12 ("6-wire RJ-11") connectors, DTE

**Connectors:** All chassis: (1) IEC 320 power;  
KV132A-R2: Also has (10) DB25 F, (2) RJ-11;  
KV134A-R2: Also has (20) DB25 F, (4) RJ-11;  
KV1300C: (4) DB25 F;  
KV1301C-R2: (5) DB25 F;  
KV1305C: (2) DB15 F, (2) DB15 M;  
KV1306C: (4) HD15 M, (4) HD15 F;  
KV1308C: (18) RJ-45 F;  
KV140 series cables: (1) DB15 F, (1) DB15 M;  
KV180 series cables: (1) HD15 M, (1) HD15 F;  
KV130 series cables: (2) RJ-45 M

**Indicators:**  
All models: ON/OFF switch(es) are dark when ServSwitch Affinity is OFF, backlit when ON;  
KV13xDA models: (3) Front-mounted power-supply status LEDs:  
(1) for supply 1 (the upper transformer), lit while supply is outputting power;  
(1) for supply 2 (the lower transformer), lit while supply is outputting power;  
(1) for the ServSwitch Affinity chassis (marked "SYSTEM"), lit while either supply is outputting power unless internal diodes have failed

**Temperature Tolerance:**  
32 to 113°F (0 to 45°C)

**Humidity Tolerance:**  
Up to 80%, noncondensing

**Maximum Altitude:**  
10,000 ft. (3048 m)

**Power:**  
Input: 90 to 264 VAC, 47 to 63 Hz, 700 mA from AC outlet(s) through included power cord(s) and inlet(s) into internal transformer(s);  
KV13xDA models: Dual transformers with separate AC inlets, electrically isolated from one another;  
All other models: Single transformer;  
Consumption: Up to 40 VA (40 watts)

**Size:** KV132A-R2, KV130A, KV130DA, KV134A-R2, KV138A, KV138DA: 5.3"H (3U) x 16.7"W x 7"D (13.5 x 42.4 x 17.8 cm);  
KV139A, KV139DA: 7"H (4U) x 16.7"W x 7"D (17.8 x 42.4 x 17.8 cm);  
KV1300C, KV1301C-R2, KV1305C–KV1306C, KV1308C: 0.9"H x 13.9"W x 4.8"D (2.3 x 35.3 x 12.2 cm);  
KV1304C: 0.1"H x 4"W x 3"D (0.3 x 10.2 x 7.6 cm)

**Weight:** KV132A-R2, KV130DA, KV138DA: 12 lb. (5.4 kg);  
KV130A, KV138A: 10.5 lb. (4.8 kg);  
KV134A-R2: 14 lb. (6.4 kg);  
KV139A: 11 lb. (5 kg);  
KV139DA: 12.5 lb. (5.7 kg);  
KV1300C, KV1301C-R2: 0.9 lb. (0.4 kg);  
KV1304C: 0.2 lb. (0.1 kg);  
KV1305C–KV1306C, KV1308C: 0.4 lb. (0.2 kg)

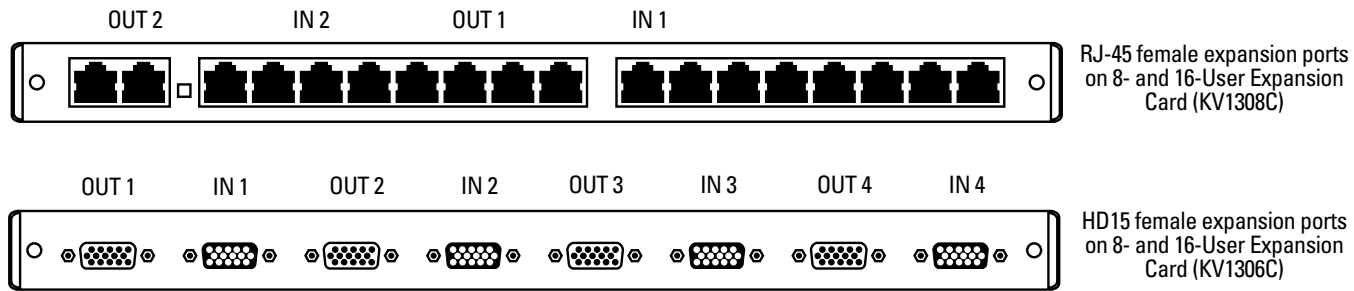
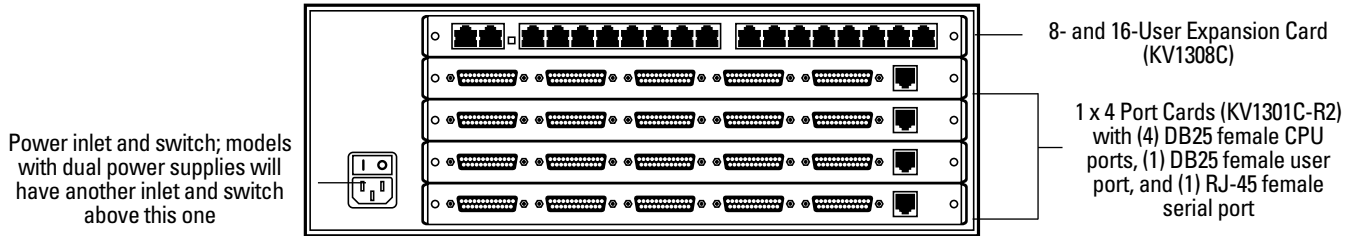
If you need to share access to a large number of CPUs, think about putting in a ServSwitch Affinity daisychain made up of 4-user expansion chassis (like the fully loaded one shown below) or 8- or 16-user chassis. They come empty (no cards installed), but you can install one expansion card (or two in the 16-user units) and add as many as four 0 x 4 or 1 x 4 port

cards to them, giving you a maximum of four, eight, or sixteen user stations and sixteen CPUs attached to each unit. (Keep in mind that however many user stations a unit is designed for, only that many video paths can be open through that unit at a time. For example, a 4-user unit only has four video paths, so if there are already four users attached to

a 4-user unit, and a user at another ServSwitch Affinity selects one of the 4-user unit's CPUs, one of the 4-user unit's users—and all other users on that slot—will be locked out until the new connection ends.)

The 8-user units look very similar to the 4-user unit, but they accept only 8-user expansion cards like the one shown below.

The 16-user units accept two of the 8-user expansion cards. The 8-user cards have jumper blocks that you can set to control which four KVM slots are used by the users attached to the ServSwitch Affinity chassis that the card is installed in: KVM 1 through 4, 5 through 8, 9 through 12, or 13 through 16.



On the 8- and 16-User RJ-45 Expansion Cards (above, top), IN 1 and OUT 1 carry signals for the port cards in slots 1 and 2, while IN 2 and OUT 2 carry signals for the port cards in slots 3 and 4. This pattern repeats for slots up to slot 16.

On the 8- and 16-User HD15 Expansion Cards (above, bottom),

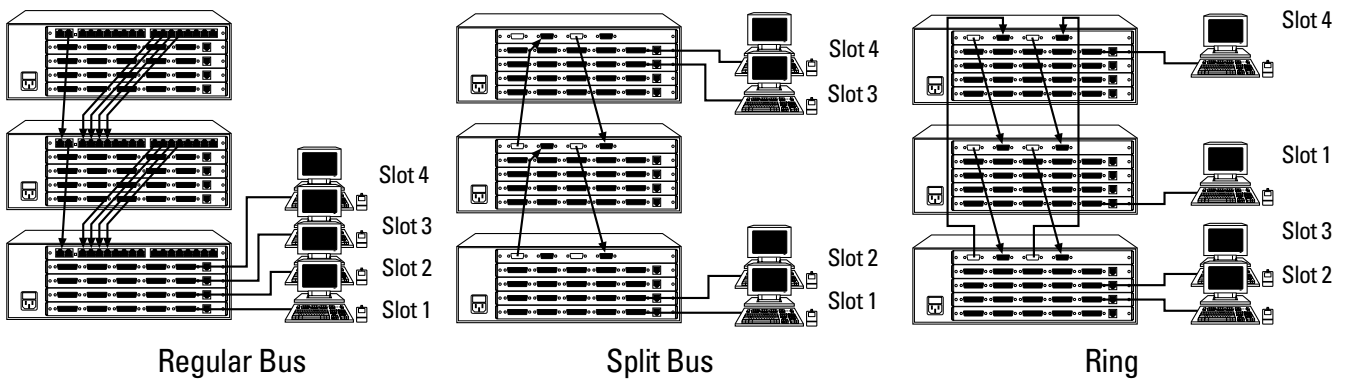
IN 1 and OUT 1 carry the signals for either KVM 1 and 2 or, if installed in the bottom slot of a 16-user unit, KVM 9 and 10; IN 2 and OUT 2 carry the signals for either KVM 3 and 4 or KVM 11 and 12; and so on. A pair of jumper blocks, mentioned above, determines which four KVM slots

the four users on that ServSwitch Affinity chassis will use.

Because the control paths are carried on different connectors this way, you have maximum flexibility for designing your daisychain layout:

- If all of your users are on one chassis, use the regular bus topology (below, left).

- If you have two users on one chassis and two on another, use the "split bus" topology (below, middle).
- If your users are spread across several chassis, use the ring topology (below, right).\*



\*Keep in mind that only one user at a time can use the bus that interconnects daisychained ServSwitch Affinity units, especially when you implement a ring topology. For example, when your ServSwitch Affinity units are interconnected in a ring, if any user on slot 1 selects a CPU attached to a ServSwitch Affinity unit other than his own, no other slot 1 user can select any CPUs.

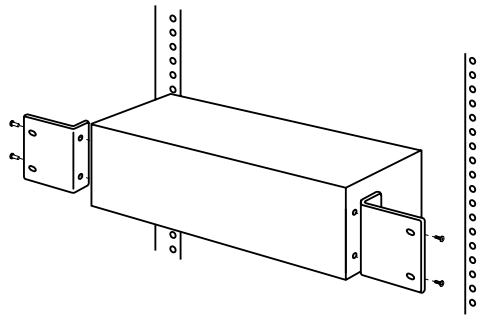
## The complete package

- The ServSwitch Affinity, including any cards and blanking plates that are normally preinstalled with your model. (Blanking plates will cover all unused slots, as well as the slot on 4-user models that the tiny terminator card is installed in.)
- A power cord.
- *KV13xDA models only:* A second power cord.
- A 6-ft. (1.8-m) serial cable with RJ-12 ("6-wire RJ-11") plugs.
- An RJ-12-to-DB9 modular adapter.
- A users' manual.

## What else you might need

- CPU adapter cables, user adapter cables, and (if you're cascading) expansion cables.
- Keyboards, mice, and monitors for your users. If you're mixing platforms, we recommend true multiscan, multisync monitors capable of syncing to each CPU's video-output frequencies and compatible with all of the CPUs' video cards. Also, if one of the multiple platforms is IBM, the monitors must be able to accept both separate H/V sync and composite sync. (Such monitors are widely available.) We recommend that the monitors be able to display a maximum resolution of not less than 1280 x 1024 at a maximum refresh rate of not less than 75 Hz.
- An AC-power surge protector and uninterruptible power supply.
- Data-line surge protectors for the keyboard and mouse lines.
- *If you purchase a 4-User Expansion Chassis or an 8- or 16-User Chassis:* port cards for your CPU and user-station connections.
- *To cascade a ServSwitch Affinity:* An expansion card.
- *To rackmount a ServSwitch Affinity:* A ServSwitch Affinity rackmount kit.

If you can use a screwdriver, you can install the rackmount kits.



## Ordering Information

ITEM	CODE
<b>ServSwitch Affinity</b>	
4-User Expansion Chassis (Terminator Card installed, no Port Cards installed)	
Single power supply .....	KV130A
Dual power supply .....	KV130DA
4-User Standalone Chassis	
2 Users by 8 CPUs (Terminator Card installed, 1 x 4 Port Cards installed in slots 1 and 2) .....	KV132A-R2
4 Users by 16 CPUs (Terminator Card installed, 1 x 4 Port Cards installed in slots 1 through 4) .....	KV134A-R2
8-User Chassis (no cards installed)	
Single power supply .....	KV138A
Dual power supply .....	KV138DA
16-User Chassis (no cards installed)	
Single power supply .....	KV139A
Dual power supply .....	KV139DA
<b>Port Cards</b>	
0 x 4 (No Users, Four CPUs) .....	KV1300C
1 x 4 (One User, Four CPUs) .....	KV1301C-R2
4-User Terminator Card .....	KV1304C
4-User Expansion Card, DB15 .....	KV1305C
8- and 16-User Expansion Card, HD15 .....	KV1306C
8- and 16-User Expansion Card, RJ-45 .....	KV1308C

# Ordering Information (continued)

ITEM

CODE

*If you've previously ordered a KV1301C and want to upgrade it to a KV1301C-R2 with serial capabilities, order...*

ServSwitch Affinity Upgrade Kit.....KV130-UPG

*You will need a **CPU Cable** for each CPU you attach...*

CPU/Server to ServSwitch™ Cables

Standard and Coaxial CPU Cables

PS/2, Standard

5-ft. (1.5-m) .....EHN151-0005

10-ft. (3-m) .....EHN151-0010

20-ft. (6.1-m) .....EHN151-0020

PS/2, Coax

2-ft. (0.6-m) .....EHN382-0002

5-ft. (1.5-m) .....EHN382-0005

10-ft. (3-m) .....EHN382-0010

20-ft. (6.1-m) .....EHN382-0020

35-ft. (10.7-m) .....EHN382-0035

50-ft. (15.2-m) .....EHN382-0050

75-ft. (22.9-m) .....EHN282-0075

100-ft. (30.5-m) .....EHN282-0100

AT, Standard

5-ft. (1.5-m) .....EHN048-0005

10-ft. (3-m) .....EHN048-0010

20-ft. (6.1-m) .....EHN048-0020

Sun, Coax, 13W3

5-ft. (1.5-m) .....EHN206-0005

10-ft. (3-m) .....EHN206-0010

20-ft. (6.1-m) .....EHN206-0020

35-ft. (10.7-m) .....EHN206-0035

50-ft. (15.2-m) .....EHN206-0050

75-ft. (22.9-m) .....EHN206-0075

100-ft. (30.5-m) .....EHN206-0100

VGA, Coax

5-ft. (1.5-m) .....EHN515-0005

10-ft. (3-m) .....EHN515-0010

20-ft. (6.1-m) .....EHN515-0020

35-ft. (10.7-m) .....EHN515-0035

50-ft. (15.2-m) .....EHN515-0050

75-ft. (22.9-m) .....EHN515-0075

100-ft. (30.5-m) .....EHN515-0100

USB, Coax

5-ft. (1.5-m) .....EHN485-0005

10-ft. (3-m) .....EHN485-0010

20-ft. (6.1-m) .....EHN485-0020

35-ft. (10.7-m) .....EHN485-0035

50-ft. (15.2-m) .....EHN485-0050

75-ft. (22.9-m) .....EHN485-0075

100-ft. (30.5-m) .....EHN485-0100

# Ordering Information (continued)

ITEM

CODE

*You will need a **User Cable** for each monitor/keyboard/mouse user station you attach...*

ServSwitch to Keyboard/Monitor/Mouse Cables

Regular (non-coaxial) User Cables, available in standard lengths up to 20 ft. (6.1 m)

PS/2, Standard

1-ft. (0.3-m).....	EHN154-0001
5-ft. (1.5-m).....	EHN154-0005
10-ft. (3-m).....	EHN154-0010
20-ft. (6.1-m).....	EHN154-0020

Coaxial User Cables

PS/2

2-ft. (0.6-m).....	EHN383-0002
5-ft. (1.5-m).....	EHN383-0005
10-ft. (3-m).....	EHN383-0010
20-ft. (6.1-m).....	EHN283-0020
35-ft. (10.7-m).....	EHN383-0035
50-ft. (15.2-m).....	EHN383-0050
100-ft. (30.5-m).....	EHN383-0100

Sun, Coax

13W3

1-ft. (0.3-m).....	EHN201-0001
5-ft. (1.5-m).....	EHN201-0005
10-ft. (3-m).....	EHN201-0010
20-ft. (6.1-m).....	EHN201-0020
35-ft. (10.7-m).....	EHN201-0035
50-ft. (15.2-m).....	EHN201-0050
100-ft. (30.5-m).....	EHN201-0100

VGA

1-ft. (0.3-m).....	EHN225-0001
5-ft. (1.5-m).....	EHN225-0005
10-ft. (3-m).....	EHN225-0010
20-ft. (6.1-m).....	EHN225-0020
35-ft. (10.7-m).....	EHN225-0035
50-ft. (15.2-m).....	EHN225-0050
75-ft. (22.9-m).....	EHN225-0075
100-ft. (30.5-m).....	EHN225-0100

*To connect multiple chassis, order...*

Expansion Cables for 4-User Units, PVC

10-ft. (3-m).....	KV140010
20-ft. (6.1-m).....	KV140020
35-ft. (10.7-m).....	KV140035
50-ft. (15.2-m).....	KV140050
100-ft. (30.5-m).....	KV140100

Expansion Cable for 4-User Units, Plenum

50-ft. (15.2-m).....	KV140050-PL
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# Ordering Information (continued)

ITEM	CODE
Expansion Cables for 8- and 16-User Units, PVC	
10-ft. (3-m) .....	KV180010
20-ft. (6.1-m) .....	KV180020
35-ft. (10.7-m) .....	KV180035
50-ft. (15.2-m) .....	KV180050
100-ft. (30.5-m) .....	KV180100
Expansion Cable for 8- and 16-User Units, Plenum	
50-ft. (15.2-m) .....	KV180050-PL
<i>To connect multiple chassis with RJ-45 expansion cards, order...</i>	
ServSwitch Affinity Expansion Cables, RJ-45 Coax	
2-ft. (0.6-m) .....	KV130002
5-ft. (1.5-m) .....	KV130005
10-ft. (3-m) .....	KV130010
20-ft. (6.1-m) .....	KV130020
35-ft. (10.7-m) .....	KV130035
50-ft. (15.2-m) .....	KV130050
75-ft. (22.9-m) .....	KV130075
100-ft. (30.5-m) .....	KV130100
<i>You might also need...</i>	
Serial Cables	
DTE Cables with DB9 Female Connector	
5-ft. (1.5-m) .....	EHN290-0005
10-ft. (3-m) .....	EHN290-0010
20-ft. (6.1-m) .....	EHN290-0020
35-ft. (10.7-m) .....	EHN290-0035
50-ft. (15.2-m) .....	EHN290-0050
DTE Cables with DB25 Female Connector	
5-ft. (1.5-m) .....	EHN291-0005
10-ft. (3-m) .....	EHN291-0010
20-ft. (6.1-m) .....	EHN291-0020
35-ft. (10.7-m) .....	EHN291-0035
50-ft. (15.2-m) .....	EHN291-0050
DCE Cables with DB9 Male Connector	
5-ft. (1.5-m) .....	EHN292-0005
10-ft. (3-m) .....	EHN292-0010
20-ft. (6.1-m) .....	EHN292-0020
35-ft. (10.7-m) .....	EHN292-0035
50-ft. (15.2-m) .....	EHN292-0050
DCE Cables with DB25 Male Connector	
5-ft. (1.5-m) .....	EHN293-0005
10-ft. (3-m) .....	EHN293-0010
20-ft. (6.1-m) .....	EHN293-0020
35-ft. (10.7-m) .....	EHN293-0035
50-ft. (15.2-m) .....	EHN293-0050

## ***Ordering Information (continued)***

**ITEM**

**CODE**

**Rackmount Kits**

To mount 4- or 8-User units in 19" Racks .....	RMK19A
To mount 4- or 8-User units in 23" Racks .....	RMK23A
To mount 4- or 8-User units in 24" Racks .....	RMK24A
To mount 16-User units in 19" Racks.....	RMK19A139
To mount 16-User units in 23" Racks.....	RMK23A139
To mount 16-User units in 24" Racks.....	RMK24A139
Surge protector for IBM PS/2 style keyboard and mouse lines (6-pin mini-DIN M/F) .....	SP519A-R2
Surge protector for IBM PC/AT style keyboard lines (5-pin DIN M/F).....	SP518A-R2

*Call Black Box Tech Support for help determining your best options for AC-power backup and protection.*